

## **REMARKS**

This Amendment responds to the final Office Action mailed on December 17, 2007 and is being enclosed with a Request for Continued Examination submitted concurrently herewith. This Amendment represents a fully responsive submission, as required under 37 CFR § 1.114. Claims 1-20 are pending. Claims 1, 5-8, 11, 15, and 17 have been amended. Claims 18-20 are new. In view of the foregoing amendments, as well as the following remarks, Applicants respectfully submit that this application is in complete condition for allowance and request reconsideration of the application in this regard.

### **Rejection of Claims Under 35 U.S.C. § 102**

Claims 1-3, 5, and 8-10 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,891,350 to Shan et al. (hereinafter *Shan*). Of these claims, claim 1 is the only independent claim. The Examiner contends that *Shan* shows or teaches all the elements of the rejected claims. Applicants respectfully disagree with the Examiner's contention for the reasons set forth below.

In contrast to Applicants' amended independent claim 1, *Shan* fails to disclose or suggest "a tubular separating member directly contacting said first electrode and directly contacting said second electrode to define a sidewall extending between said first electrode and said second electrode," and that "said tubular separating member, said first electrode, and said second electrode bound a processing space for the substrate". In the Office Action, the Examiner identifies the cathode (30) in *Shan* as a first electrode, the chamber lid (24) in *Shan* as a second electrode, and the anode shield (10) as a separating member. The anode shield (10) identified by the Examiner as a separating member in *Shan* fails to directly contact the cathode (30) identified by the Examiner as the first electrode. With regard to the embodiment shown in Figure 1 of *Shan*, a cathode shield (12), a dielectric spacer (28), and a quartz ring (38) represent intervening structures located between the anode shield (10) and the cathode (30) that the Examiner identifies as a first electrode in *Shan*. With regard to the embodiment shown in Figure 3 and assuming that the anode shield (10) is present in this embodiment, *Shan* discloses at least an exhaust baffle (70) and the dielectric spacer (28) as intervening structures located between the anode shield (10) and the cathode (30). Regardless of the specific embodiment, the anode shield (10) in *Shan* fails to directly contact the cathode (30).

In order for a reference to anticipate the invention in a claim, the reference must teach each and every element in the precise arrangement set forth in the claim. If the reference fails to teach even one of the claimed elements, the reference does not and cannot anticipate the claimed invention. *Shan* fails to anticipate independent claim 1 because *Shan* fails to teach “a tubular separating directly contacting said first electrode and directly contacting said second electrode to define a sidewall extending between said first electrode and said second electrode”. For at least this reason, Applicants respectfully request that this rejection be withdrawn.

Because claims 2, 3, 5, and 8-10 depend from independent claim 1, Applicants submit that these claims are also patentable for at least the same reasons discussed above. Furthermore, these claims recite unique combinations of elements not taught, disclosed or suggested by *Shan*.

### **Rejection of Claims Under 35 U.S.C. § 103**

#### *Claims 15-17 over Shan in view of Suntola and Maher*

Claims 15-17 stand rejected under 35 U.S.C. § 103(a) as unpatentable over *Shan* in view of U.S. Patent No. 5,711,811 to Suntola et al. (hereinafter *Suntola*) and U.S. Patent No. 4,381,965 to Maher, Jr., et al. (hereinafter *Maher*). Of these claims, claim 15 is the sole independent claim. Applicants respectfully disagree with the rejection for the reasons set forth in the following remarks.

Independent claim 15, as amended, is patentable for at least the same reasons as Applicants’ independent claim 1. Specifically, *Shan* fails to disclose “a first tubular member directly contacting said first electrode and directly contacting said second electrode to define a first sidewall extending between said first electrode and said second electrode,” and “said first tubular separating member, said first electrode, and said third electrode bounding a first vacuum enclosure.” It follows that *Shan* also fails to disclose “a second tubular separating member directly contacting said second electrode and directly contacting said third electrode to define a second sidewall extending between said second electrode and said third electrode,” and “said second tubular separating member, said first electrode, and said third electrode bounding a second vacuum enclosure.” *Suntola* and *Maher* fail to remedy this deficiency of *Shan*. With regard to a rejection under 35 U.S.C. § 103(a), a *prima facie* case of obviousness requires that the references “teach or suggest all the claim limitations.” See MPEP 2143.03. Accordingly, the

Examiner has failed to establish a *prima facie* case of obviousness. For this reason alone, Applicants request that the rejection be withdrawn.

Independent claim 15 is patentable for additional reasons. Specifically, Applicants traverse with the Examiner's reasons to combine *Suntola* and *Shan* and to combine *Maher* with *Suntola* and *Shan*.

The Examiner states on page 16 of the Office Action that "the basic fundamental teaching of Suntola is processing 'multiple substrates' in parallel according to his plural 'chambers'/'reactors' accomodating (*sic*) plural substrates." No modification of Suntola is suggested by the Examiner. Motivation for Shan to process plural substrates is supported by Suntola as described above." On page 9 of the Office Action, the Examiner states that "[m]otivation to add Suntola's apparatus (Figure 3) with Maher's plasma generating apparatus includes, among plural motivations, for plasma processing as taught by Suntola (column 1, lines 42-44), and for processing plural substrates for greater through-put compared to Shan as taught by Suntola."

Applicants submit that a person having ordinary skill in the art would have had no reason to modify the combination *Shan* and *Suntola* based upon the disclosure in the secondary reference *Maher*. Specifically, *Maher* teaches that if multiple electrodes are present for processing multiple substrates, then those electrodes must be situated inside "a known bell-jar type of vacuum chamber (not shown)." See column 4, lines 7-10. Hence, a person having ordinary skill in the art would not have a reason to modify *Shan* such that the electrodes (24, 30) are themselves placed inside of another vacuum enclosure and do not participate in bounding a vacuum enclosure. Therefore, a person having ordinary skill in the art would not have realized a reasonable expectation of success to modify the combined disclosures of *Shan* and *Suntola* in this manner based upon the disclosure in *Maher*. For at least these reasons, Applicants submit that the Examiner has failed to establish *prima facie* obviousness. Therefore, Applicants request that the Examiner withdraw the rejection of independent claim 15.

In the Office Action, the Examiner relies that the apparatus shown in Figure 3 of *Suntola* as teaching the processing of plural substrates. In relation to a motivation to combine *Suntola* with *Shan*, the Examiner directs the Applicants' attention to the teachings at column 1, lines 42-44 of *Suntola*, which is found within the Background Section of *Suntola*, apply to an abstract, hypothetical MBE or CVD reactor. However, the Written Description of *Suntola* fails to

describe how the apparatus that is shown in Figure 3 can be used (or can be modified) to perform a deposition process involving a plasma. The Examiner states in the Office Action that he is not suggesting a modification of *Suntola*, but instead merely a motivation to process multiple substrates in *Shan*. Applicants argument is that *Suntola* fails to disclose how the non-plasma apparatus shown in Figure 3 could somehow teach a person having ordinary skill in the art how to modify the plasma apparatus in *Shan* to process multiple substrates. In other words, the disclosure at column 1, lines 42-44 of *Suntola* is not an enabling disclosure that would have taught a person having ordinary skill in the art how to modify *Shan* based upon the disclosure in Figure 3 of *Suntola*. There is no other discussion of a plasma process in *Suntola* other than this isolated reference that states a textbook teaching that plasma-assisted MBE and CVD processes exist. A person having ordinary skill in the art would have failed to appreciate from the disclosure at column 1, lines 42-44 of *Suntola* that there is a reasonable expectation of success to modify *Shan* to treat multiple substrates. At least some degree of predictability is required. *Suntola* does not contain any enabling detail of how to modify a plasma processing device, as in *Shan*, to treat multiple substrates.

Applicants submit that a person having ordinary skill in the art would have had no reason to modify *Shan* based upon the disclosure in *Suntola* to process multiple substrates, as contended by the Examiner. Specifically, *Suntola* is directed to a system for depositing thin films by vapor phase deposition in a non-plasma atomic layer epitaxy (ALE) process. To process multiple substrates, *Suntola* stacks the substrates in multiple chambers (38) defined by a stack of planar elements (32). However, *Suntola* fails to disclose how the stacked planar elements (32) could somehow be modified to permit the processing of multiple substrates in the plasma deposition system of *Shan*. For example, *Suntola* fails to disclose or suggest how a person having ordinary skill in the art would connect the planar elements (32) in *Suntola* (which the Examiner admits on page 14 of the Office Action are made from an electrically insulating material) with a power supply, such as power supply (60) in *Shan*, in order to generate a plasma inside the chambers (38).

Accordingly, a person having ordinary skill in the art would not have had any reason to modify *Shan* in the manner suggested by the Examiner based upon the disclosure in *Suntola*. For at least this reason, Applicants submit that the Examiner has failed to establish *prima facie*

obviousness. Therefore, Applicants request that the rejection of independent claim 15 be withdrawn.

Moreover, the proposed modification based upon *Suntola* would have rendered the plasma-processing apparatus of *Shan* unsuitable for its intended purpose, which is prohibited under MPEP § 2143.01. Specifically, the modification proposed by the Examiner would eliminate the electrodes (24, 30) coupled with power supply (60) in *Shan* and, in their place, would substitute a stack of dielectric planar elements (32) coupled with a precursor source, as taught by *Suntola*. Accepting the Examiner’s construction that the planar elements are formed from an electrically insulating material material, the planar elements (32) in *Suntola* are not capable of being coupled with a power supply to generate a plasma in chambers (38) and are not configured in any way to perform a plasma process. Hence, if modified as suggested by the Examiner, the apparatus in *Shan* would no longer be capable of generating a plasma, which would render the plasma processing system described in *Shan* unsuitable for its intended purpose.

The proposed modification based upon *Suntola* would also have changed the principle of operation of *Shan*, which is also prohibited under MPEP § 2143.01. Specifically, if *Shan* were modified as suggested by the Examiner, the principle of operation of *Shan* would be converted from a plasma deposition process to a non-plasma deposition process.

The Examiner simply states that he is applying *Suntola*, quoting the Examiner, as a “basic fundamental teaching of Suntola is processing plural ‘multiple substrates’ in parallel.” Accepting this at face value, the Examiner ignores that, in order to apply the teachings of *Suntola* to supply the allegedly missing structural features in *Shan*, the construction of *Shan* must be modified to an extent that would have rendered the apparatus in *Shan* no longer suitable for its intended purpose and to an extent that would have changed the principle of operation of *Shan*.

For at least these additional reasons, Applicants submit that the Examiner has failed to establish *prima facie* obviousness. Therefore, Applicants request that the Examiner withdraw the rejection of independent claim 15.

Because claims 16 and 17 depend from independent claim 15, Applicants submit that these claims are also patentable for at least the same reasons discussed above. Furthermore, these claims recite unique combinations of elements not disclosed or suggested by the combined disclosures of *Shan*, *Suntola* and *Maher*.

Claims 4, 6, 7, and 11-14 over Shan in view of Hirooka

Claims 4, 6, 7, and 11-14 stand rejected under 35 U.S.C. § 103(a) as unpatentable over *Shan* in view of U.S. Patent No. 6,700,089 to Hirooka (hereinafter *Hirooka*). *Hirooka* fails to remedy the fundamental deficiencies of *Shan*. Because claims 10-13, 15, and 16 depend from independent claim 1, Applicants submit that these claims are also patentable for at least the same reasons as independent claim 1. Furthermore, claims 4, 6, 7, and 11-14 recite unique combinations of elements not disclosed or suggested by *Shan* in view of *Hirooka*.

**New Claims**

Claims 18-20 have been submitted as new claims that depend from independent claim 1 and, therefore, are patentable for at least the same reason. Furthermore, each of these new dependent claims recites a unique combination of elements not disclosed or suggested by the art of record.

**CONCLUSION**

Applicants have made a bona fide effort to respond to each and every requirement set forth in the Office Action. In view of the foregoing amendments and remarks, this application is submitted to be in complete condition for allowance and, accordingly, a timely notice of allowance to this effect is earnestly solicited. In the event that any issues remain outstanding, the Examiner is invited to contact the undersigned to expedite issuance of this application.

Applicants do not believe any fees are due in connection with filing this communication. However, if such petition is due or any fees are necessary, the Commissioner may consider this to be a request for such and is hereby authorized to charge any under-payment or fees associated with this communication, or to credit any over-payment, to Deposit Account No. 23-3000.

Respectfully submitted,  
WOOD, HERRON & EVANS, L.L.P.

By: /William R. Allen/  
William R. Allen, Ph.D.  
Reg. No. 48,389

2700 Carew Tower  
Cincinnati, Ohio 45202  
(513) 241-2324 (voice)  
(513) 241-6234 (facsimile)